## What is claimed is:

- 1. A method for controlling, and distributing information between a digital postage meter and a certifying station operated by a certifying authority CA for publishing information, so that a public key Key<sub>DM</sub>\*P of said digital postage meter can be determined by a party seeking to verify indicia printed by said digital postage meter from said published information with assurance that said public key Key<sub>DM</sub>\*P has been certified by said certifying authority CA, said method comprising the steps of:
- a) defining and publishing a finite group [P] with a binary operation [+] and publishing a particular point P in said group;
- b) defining and publishing a binary operation K\*P, where K is an integer and P is a point in said group, such that K\*P is a point in said group computed by applying said operation [+] to K copies of said point P, and computation of K from knowledge of the definition of said group [P], said point P, and K\*P is hard;
- c) controlling a certifying station to publish a certificate CERT<sub>DM</sub> for said digital postage meter, wherein;

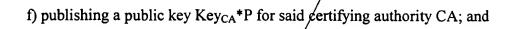
 $CERT_{DM} = /(r_{DM} + r_{CA}) *P$ ; and wherein

r<sub>DM</sub> is a random integer generated by said digital postage meter and r<sub>CA</sub> is a random integer generated by said certifying station;

- d) controlling/said certifying station to publish a message M;
- e) controlling said certifying station to generate an integer  $I_{DM}$ , and send said integer to said digital postage meter, wherein;

 $I_{DM} = r_{CA} + H(M)Key_{CA}$ ; and wherein

H(M) is an integer derived from said message M in accordance with a publicly known algorithm H and Key<sub>CA</sub> is a private key of said certifying authority CA;



- g) controlling said digital postage meter to compute a private key  $Key_{DM}$ ,  $Key_{DM} = r_{DM} + I_{DM} = r_{DM} + r_{CA} + H(M)Key_{CA}$ ; and
- h) controlling said digital postage meter to print an indicium and digitally sign said indicium with said key Key<sub>DM</sub>; whereby
  - i) said verifying party can compute said user's public key  $Key_{DM}*P$  as  $Key_{DM}*P = CPRT_{DM} + H(M) Key_{CA}*P = (r_{DM} + r_{CA})*P + H(M)Key_{CA}*P$

from knowledge of H, M/[P], said public key Key<sub>CA</sub>\*P, and CERT<sub>DM</sub>.

- A method as described in claim, wherein said publicly known manner for deriving an integer from said published information comprises applying a hashing function to said message M.
- A method as described in claim wherein said message M includes information IAV identifying said digital postage meter and operating parameters applicable to said digital postage meter.
- A method as described in claim wherein said message M includes information IAV identifying said digital postage meter and operating parameters applicable to said digital postage meter.

A method as described in claim wherein said group [P] is defined on an elliptic curve.

A method as described in claim 1 wherein said message M includes information tying said user's public key Keyu\*P to said information IAV.

7. A article having an indicium imprinted thereon as evidence of attributes of said article, said indicium comprising:

- a) a signature generated with a private key of a first party;
- b) a certificate;
- c) information specifying attributes of said article; wherein
- d) said private key of said first party is generated as a function of said certificate, said information, and a private key of a certifying authority, said function being chosen so that a party wishing to verify said indicium can determine a public key corresponding to said private key of said first party by operating on said certificate and said information with a corresponding public key of said certifying authority.
- 8. A method for controlling a digital postage meter to print indicia signed with a private key Key<sub>DM</sub> based upon a published a finite group [P] with a binary operation [+] and a published particular point P in said group and a published a binary operation K\*P, where K is an integer and P is a point in said group, such that K\*P is a point in said group computed by applying said operation [+] to K copies of said point P, and computation of K from knowledge of the definition of said group [P], said point P,

- d) said first function, said second function and said published related information are chosen so that a party seeking to verify said indicia can compute said digital postage meter public key by operating on said published related information with said published public key of said authority.
- A method as described in claim 10 wherein said published related information includes information identifying said digital postage meter and operating parameters applicable to said digital postage meter.
- 12. A method for certification by a certifying authority of a public key of a digital postage meter, said digital postage meter producing indicia signed with a corresponding private key of said digital postage meter, said certifying authority having a published public key and a corresponding private key, said method comprising the steps of:
- a) said certifying authority providing a user with an integer, said integer being a first function of said private key of said authority;
- b) said user computing a digital postage and postage and downloading said postage meter private key as a second function of said integer and downloading said postage meter private key to said digital postage meter; and
  - c) said certifying authority publishing related information; wherein
- d) said first function, said second function and said published related information are chosen so that a party seeking to verify said indicia can compute said digital postage meter public key by operating on said published related information with said published public key of said authority.

A method as described in claim 12 wherein said published related information includes information identifying said digital postage meter and operating parameters applicable to said digital postage meter.

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and K\*P is hard, so that a public key Key<sub>DM</sub>\*P of said digital postage meter can be determined by a party seeking to verify indicia printed by said digital postage meter from published information with assurance that said public key Key<sub>DM</sub>\*P has been certified by a certifying authority CA, said method comprising the steps of:

- a) controlling said digital postage meter to generate a random number  $r_{DM}$  and send a point  $r_{DM}$ \*P to a certifying station;
- b) controlling said digital postage meter to receive a certificate  $CERT_{DM}$  from a certifying station operated by said certifying authority CA, wherein;

 $CERT_{DM} = (r_{DM} + r_{CA})*P$ ; and wherein

 $r_{DM}$  is a random integer generated by said digital postage meter and  $r_{CA}$  is a random integer generated by said certifying station;

c) controlling said digital postage meter to receive an integer  $I_{\text{DM}}$  from said certifying station, wherein;

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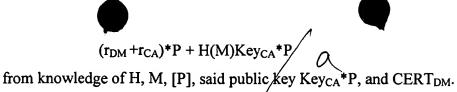
 $I_{DM} = r_{CA} + H(M)Key_{CA}$ ; and wherein

M is a message published by said certifying station and H(M) is an integer derived from said message M in accordance with a publicly known algorithm H and Key<sub>CA</sub> is a private key of said certifying authority CA;

- d) controlling said digital postage meter to compute a private key Key<sub>DM</sub>,  $Key_{DM} = r_{DM} + I_{DM} = r_{DM} + r_{CA} + H(M)Key_{CA}; \text{ and}$
- e) controlling said digital postage meter to print an indicium and digitally sign said indicium with said key Key<sub>DM</sub>; whereby

f) said verifying party can compute said digital postage meter public key Key<sub>DM</sub>\*P as

$$Key_{DM}^*P = CERT_{DM} + H(M) Key_{CA}^*P =$$



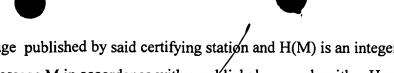
- 9. A method for controlling a certifying station operated by a certifying authority CA to publish information relating to a digital postage meter for printing indicia signed with a private key Key<sub>DM</sub> based upon a published a finite group [P] with a binary operation [+] and a published particular point P in said group and a published a binary operation K\*P, where K is an integer and P is a point in said group, such that K\*P is a point in said group computed by applying said operation [+] to K copies of said point P, and computation of K from knowledge of the definition of said group [P], said point P, and K\*P is hard, so that a public key Key<sub>DM</sub>\*P of said digital postage meter can be determined by a party seeking to verify indicia printed by said digital postage meter from said published information with assurance that said public key Key<sub>DM</sub>\*P has been certified by a certifying authority CA, said method comprising the steps of:
- a) controlling said certifying station to receive a point  $r_{DM}$ \*P from said digital postage meter, where  $r_{DM}$  is a random number generated by said digital postage meter;
- b) controlling said certifying station to generate and send to said digital postage meter a certificate CERT<sub>DM</sub>, wherein;

$$CERT_{DM} = (r_{DM} + r_{CA})*P$$
; and wherein

r<sub>CA</sub> is a random integer generated by said certifying station;

c) controlling said certifying station to generate and send to said digital postage meter an integer I<sub>DM</sub>, wherein;

 $I_{DM} = r_{CA} + H(M)Key_{CA}$ ; and wherein



M is a message published by said certifying station and H(M) is an integer derived from said message M in accordance with a publicly known algorithm H and Key<sub>CA</sub> is a private key of said certifying authority CA; whereby

- d) said digital postage meter can compute said private key  $Key_{DM}$ ,  $Key_{DM} = r_{DM} + I_{DM} = r_{DM} + r_{CA} + H(M)Key_{CA}$ ; and and digitally sign said indicium with said key  $Key_{DM}$ ; and whereby
  - e) said verifying party can compute said digital postage meter public key

Key<sub>DM</sub>\*P as

$$Key_{DM} *P = CERT_{DM} + H(M) Key_{CA} *P = (r_{DM} + r_{CA}) *P + H(M) Key_{CA} *P$$

from knowledge of H, M, [P], said public key Key<sub>CA</sub>\*P, and CERT<sub>DM</sub>.

10. A method for certification by a certifying/authority of a public key of a digital postage meter, said digital postage meter producing indicia signed with a corresponding private key of said digital postage meter, said certifying authority having a published public key and a corresponding private key, said method comprising the steps of:

- a) said certifying authority providing said meter with an integer, said integer being a first function of said private key of said authority;
- b) said meter computing a digital postage meter private key as a second function of said integer; and
  - c) said certifying authority publishing related information; wherein